

## DAVID H. BAILEY

3 June 2004

### Current Position:

Chief Technologist, Computational Research Dept., Lawrence Berkeley National Laboratory

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### Academic Background

B.S. 1972, mathematics, Brigham Young University

Ph.D. 1976, mathematics, Stanford University

### Professional Society Memberships

American Mathematical Society (AMS)

Association for Computing Machinery (ACM)

IEEE Computer Society (IEEE-CS)

Mathematical Association of America (MAA)

### Major Awards

1. *The 1993 Sidney Fernbach Award.* This award is presented by the IEEE Computer Society at the annual Supercomputing conferences for outstanding contributions to the field of high performance computing. The citation mentioned work in FFTs, matrix multiplication, multiple precision arithmetic, and the NAS Parallel Benchmarks.
2. *The 1993 Chauvenet Prize.* This award is presented by the Mathematical Association of America (MAA) at the annual AMS-MAA conferences, for outstanding mathematical articles. Past recipients include many well-known mathematicians of the twentieth century. The article cited for this award was “Ramanujan, Modular Equations and Approximations to Pi,” which was co-authored by Jonathan Borwein, Peter Borwein and myself (see paper 9 below).
3. *The 1993 Merten Hasse Prize.* This award, which is also granted by the MAA, is presented annually for outstanding mathematical articles. The article cited for this award was “Ramanujan, Modular Equations and Approximations to Pi” (see paper 9 below).
4. *The 1995 H. Julian Allen Award.* This award is presented annually by NASA Ames Research Center for outstanding research work and papers. The article cited for this award was “The NAS Parallel Benchmarks,” co-authored with several NASA scientists (see papers 19 and 23).
5. *CSE “Algorithms of the Century.”* In January 2000, the PSLQ algorithm, which was developed by Helaman Ferguson, Stephen Arno and myself, was named one of the ten “algorithms of the century” by the editors of the publication *Computing in Science and Engineering* (see papers 42 and 46 below).
6. *BYU Honored Alumnus, College of Physical and Mathematical Sciences (2001).* Awarded by the Brigham Young University Alumni Association.

## Overview of Research Activities

*High performance computing.* I have written papers on numerical algorithms and performance analyses of high-end scientific computer systems. I am a co-author of the NAS Parallel Benchmarks, which has been widely used to measure high-end scientific computer performance. I am currently the Performance Evaluation Research Center (PERC), an eight-institution research project funded by the Department of Energy, aimed at understanding and improving performance of scientific computations on high-end computer systems. I frequently participate in the high performance computing research community, having served for example as Technical Papers Chair of the Supercomputing 1999 conference (the largest conference series in the field).

*Computational mathematics.* I have written papers on using modern computer technology in mathematical research. My best-known result in this area (with Peter Borwein and Simon Plouffe) is a new formula for the mathematical constant  $\pi$ , which was found in 1996 using a computer program. This formula has the remarkable property that it permits one to directly calculate the  $n$ -th digit in the binary or hexadecimal expansion of  $\pi$ . In two recent papers, Richard Crandall of Reed College and I have shown that the existence of this and some related formulas means that the normality (digit randomness) of  $\pi$  and certain other mathematical constants reduces to a simple conjecture in the field of chaotic dynamics (see papers 49 and 57 below). This work has prompted numerous press reports (see "Press Reports" below). I have just completed two books on experimental mathematics co-authored by Jonathan Borwein of Canada and, for Volume 2, Roland Girgensohn of Germany (see "Books" below). At the present time, Volume 1 is offered by the *Scientific American* Book Club.

*Teaching and other work.* At the Berkeley Lab, I have participated in the NERSC-3 and NERSC-4 supercomputer procurements. This includes defining benchmarks and system requirements, preparing the Request for Proposals document, evaluating proposals, and negotiating with vendors. The NERSC-3 system is currently the world's fifth most powerful supercomputer. I taught the U. C. Berkeley graduate course "Applications in Parallel Computing" in the Spring 2000 semester, jointly with Dr. Robert Lucas of LBNL. This involved both teaching lectures and overseeing student research projects in parallel computing. I have also helped organize several workshops, some of which were co-sponsored by the Mathematical Sciences Research Institute (MSRI). These include Minorities in Applied Mathematics (1998), Parallel Symbolic Computation (1998), Algorithmic Number Theory (2000), Supercomputer Benchmarking (2001) and Experimental Math (2004).

## Press Reports (most recent listed last)

1. "Did You Ever Wonder?" LBNL main website, featured Jul 2001 to present:  
<http://www.lbl.gov/wonder/bailey.html>.
2. Charles Seife, "Pi Keeps 'Em Guessing," ScienceNow.Com (27 July 2001):  
<http://sciencenow.sciencemag.org/cgi/content/full/2001/727/1>
3. Erica Klarreich, "Pi Shared Fairly," NatureOnline.Com (2 Aug 2001):  
<http://www.nature.com/nsu/010802/010802-9.html>
4. David Whitehouse, "How Random is Pi?" British Broadcasting Company, 23 July, 2002:  
<http://news.bbc.co.uk/1/hi/sci/tech/2146295.stm>

5. Charles Seife, "Randomly Distributed Slices of Pi," *Science*, 3 Aug 2001, pg. 793:  
<http://www.sciencemag.org/cgi/content/full/293/5531/793>
6. Antonia Rotger, "Chaotische Dynamik in der Kreiszahl Pi," *Neue Zurcher Zeitung*, 9 Aug 2002: <http://www.nzz.ch/2001/10/31/ft/page-article7Q8ID.html>
7. Ivars Peterson, "Pi al a Mode," *Science News*, 1 Sep 2001, pg. 136-137 (cover story):  
<http://www.sciencenews.org/20010901/bob9.asp>
8. W. Wayt Gibbs, "A Digital Slice of Pi," *Scientific American*, May 2003  
<http://www.sciam.com/article.cfm?colID=5&articleID=00023DFC-7861-1E90-8EA5809EC5880000>
9. Erica Klarreich, "Math Lab: Computer Experiments Are Transforming Mathematics," *Science News*, (Apr 24, 2004), pg. 266-268: <http://crd.lbl.gov/~dhbailey/sci-news-2004.pdf>.

### **Professional Community Activities (most recent listed last)**

1. Program co-chairman, 1988 International Conference on Parallel Processing (1989).
2. Deputy program chairman, Supercomputing Conference (1990).
3. Program committee, Supercomputing Conference (1991-1992, 1997-1999).
4. Program committee, International Conference on Supercomputing (1991-1993).
5. Editor, IEEE Transactions on Parallel and Distributed Computing (1990-1993).
6. Tutorial committee, Supercomputing '93 and Supercomputing '94 (1993-1994).
7. Program committee, SIAM Parallel Processing Conference (1995).
8. Chair, Petaflops Algorithm Workshop (1997).
9. Tutorial committee, Supercomputing Conference (1997).
10. Board of governors, Institute for Mathematics and Applications (1996-1998).
11. Sidney Fernbach award subcommittee (1995-1998); chair (1996-1998).
12. Chair, MSRI Parallel Symbolic Computation workshop (1998).
13. Governing board, Supercomputing SIG, Association for Computing Machinery (1993-1999).
14. Technical Papers Chair, Supercomputing Conference (1999).
15. Program committee, Petaflops-2 Conference (1999).
16. Gordon Bell Prize selection committee (1996-1999); Chair (1998-1999).
17. Review Panel, DoE ASCI University Alliance program (1998-2000).
18. Review Committee, NSF Information Technology Research proposal review panel (2000).
19. Program Committee, International Conference on High Performance Computing (2000).
20. Vice Chair, International Parallel and Distributed Processing Symposium (2001).
21. Program Committee, IEEE Conference on Computer Arithmetic (2001-2003).
22. Board of editors, International Journal of High Speed Computing (1992-present).
23. Board of editors, Journal of Supercomputing (1994-present).
24. RIACS Science Council (1999-present); Chairman (2001-present)
25. Technical Papers Committee, SC2002 conference (2002).
26. Gordon Bell Prize selection committee (2002-2004).
27. Seymour Cray Prize selection committee (2002).
28. Co-Chair, Experimental Mathematics Workshop (2004).

### **Invited Talks, Tutorials and Panel Presentations (most recent listed last)**

1. "Is Scalable Parallel Computing a Myth?" panel presentation, SIAM Conference on Parallel Processing (Feb. 1995).
2. "Finding New Mathematical Identities by Supercomputer," minisymposium talk, SIAM Conference on Parallel Processing (Feb. 1995).
3. "Recognizing Numerical Constants," invited talk, Workshop on Organic Mathematics (Dec. 1995).
4. "RISC Processors and Scientific Computing," tutorial, Supercomputing '95 (Dec. 1995).
5. "Hot Chips for High Performance Computing," tutorial, Supercomputing '96 (Nov. 1996).
6. "Scientific and Business Computing: Is There Common Ground?," panel presentation, International Parallel Processing Symposium (Mar. 1998).
7. "Challenges of Future High-End Computing," invited talk, High Performance Computing Systems '98 (May 1998).
8. "Challenges of Future High-End Computing," invited presentation, 1998 International Computational Accelerator Physics Conference (Sep. 1998).
9. "Findings and Recommendations for Petaflops Computing," panel presentation, Petaflops-2 Conference (Feb. 1999).
10. "Discovering New Formulas of Math and Physics Using High Precision Integer Relation Computations," invited talk, University of Western Ontario, London, ON, Canada (Nov. 1999).
11. "Are the Digits of Pi Random?" invited seminar talk, Center for Computing Sciences, Bowie, MD (Apr. 2000); also Harvey Mudd College (Jan. 2001), U.C. Berkeley (Jan. 2002), UCLA (Jun. 2002); and the Summer Lecture Series at LBNL (Jun. 2002).
12. "Challenges of Future High-End Computing," invited plenary talk, SP World Conference (Jun. 2000); also Johns Hopkins University (Feb. 2001). This talk was reported in Infoworld: <http://www.infoworld.com/articles/hn/xml/00/06/05/000605hnibmsuper.xml>
13. "Performance Metrics: Out of the Dark Ages, High-Speed Computing Conference, Gleneden, OR (Apr. 2001).
14. "A Quad-Double Precision Floating-Point Arithmetic Package," ARITH-15, Vail, CO (June 2001).
15. "Experimental Mathematics Meets High Performance Computing," Supercomputing 2002, Baltimore, MD (Nov. 2002).
16. "Is Pi Normal?," invited seminar talk, IDA Center for Communications Research, La Jolla, CA (Nov. 2002); also at U.C. Berkeley number theory seminar (Nov. 2002), IDA CCR, Princeton, CA (Jan. 2003), and the Chudnovsky math seminar, New York (Jan. 2003).
17. "Recent Results on Normality," number theory seminar, U.C. Berkeley (April 2003).
18. "Performance of Future High-End Computers, DOE Mission Computing Conference (Jun. 2003).
19. "Mathematics by Experiment," seminar talk, U. C. Davis (January 2004).
20. "12 Ways to Fool the Masses: Back to the Future," minisymposium talk, International Parallel and Distributed Processing Symposium, Santa Fe, NM (May 2004).
21. "Experimental Mathematics: Discovering New Formulas and Theorems," DIMACS-GERAD Workshop on Computers and Discovery, Montreal, Canada (June 2004).
22. "12 Ways to Fool the Masses: Back to the Future," invited plenary talk, International Conference on Supercomputing, Heidelberg, Germany (June 2004).

## Books

1. Jonathan M. Borwein and David H. Bailey, *Mathematics by Experiment: Plausible Reasoning in the 21st Century*, A. K. Peters, Natick, MA, 2004.
2. Jonathan M. Borwein and David H. Bailey, *Experimentation in Mathematics: Computational Paths to Discovery*, A. K. Peters, Natick, MA, 2004.

## Other Publications (most recent listed last)

Online copies of most of these articles are available from the web site

<http://crd.lbl.gov/~dhbailey/dhbpapers>

1. David H. Bailey, "Vector Computer Memory Bank Contention," *IEEE Transactions on Computers*, vol. C-36, no. 3 (Mar. 1987), pg. 293-298.
2. David H. Bailey, "A High Performance Fast Fourier Transform Algorithm for the Cray-2," *Journal of Supercomputing*, vol. 1, no. 1 (Spring 1987), pg. 43-60.
3. David H. Bailey, "The Computation of Pi to 29,360,000 Decimal Digits Using Borweins' Quarcally Convergent Algorithm," *Mathematics of Computation*, vol. 50, no. 181 (Jan. 1988), pg. 283-296.
4. David H. Bailey, "Numerical Results on the Transcendence of Constants Involving Pi, E, and Gamma," *Mathematics of Computation*, vol. 50, no. 181 (Jan. 1988), pg. 275-281.
5. David H. Bailey, "A High-Performance FFT Algorithm for Vector Supercomputers," *Journal of Supercomputer Applications*, vol. 2, no. 1 (Spring 1988), pg. 82-87.
6. David H. Bailey, "Extra-High Speed Matrix Multiplication on the Cray-2," *SIAM Journal on Scientific and Statistical Computing*, vol. 9, no. 3 (May 1988), pg. 603-607.
7. Don A. Calahan and David H. Bailey, "Measurement and Analysis of Memory Conflicts on Vector Multiprocessors," *Performance Evaluation of Supercomputers*, Joanne L. Martin, ed., North-Holland, 1988, pg. 83-106.
8. David H. Bailey and Helaman R. P. Ferguson, "A Strassen-Newton Algorithm for High-Speed Parallelizable Matrix Inversion," *Proceedings of Supercomputing 1988*, Oct. 1988, pg. 419-424.
9. Jonathan M. Borwein, Peter B. Borwein and David H. Bailey, "Ramanujan, Modular Equations, and Approximations to Pi," *American Mathematical Monthly*, Mar. 1989, pg. 201-219. This paper was cited for both the Chauvenet Prize and the Merten Hesse Prize (see above).
10. David H. Bailey and Helaman R. P. Ferguson, "Numerical Results on Relations Between Numerical Constants Using a New Algorithm," *Mathematics of Computation*, vol. 53, no. 188 (Oct. 1989), pg. 649-656.
11. David H. Bailey, Horst D. Simon, John T. Barton and Martin J. Fouts, "Floating Point Arithmetic in Future Supercomputers," *International Journal of Supercomputer Applications*, vol. 3, no. 3 (1989), pg. 86-90.
12. David H. Bailey, "FFTs in External and Hierarchical Memory," *Journal of Supercomputing*, vol. 4, no. 1 (Mar. 1990), pg. 23-35.
13. David H. Bailey, Eric Barszcz, Rod A. Fatoohi, Horst D. Simon and Sisira Weeratunga, "Performance Results on the Intel Touchstone Gamma Prototype," *Proceedings of the Fifth Distributed Memory Computing Conference*, Apr. 1990, pg. 1236-1245.
14. David H. Bailey, "In Response to the Fate of Fortran-8X," *Communications of the ACM*, vol. 33, no. 4 (Apr. 1990), pg. 391-392.

15. David H. Bailey, King Lee, and Horst D. Simon, "Using Strassen's Algorithm to Accelerate the Solution of Linear Systems," *Journal of Supercomputing*, vol. 4., no. 4 (Jan. 1991), pg. 357-371.
16. David H. Bailey, "Twelve Ways to Fool the Masses When Giving Performance Results on Parallel Computers," *Supercomputing Review*, Aug. 1991, pg. 54-55. This article has been cited many times, including *The New York Times*, Sep. 22, 1991, pg. 14.
17. David H. Bailey and Paul N. Swarztrauber, "The Fractional Fourier Transform and Applications," *SIAM Review*, vol. 33 no. 3 (Sept. 1991), pg. 389-404.
18. David H. Bailey, "Performance of Two of the NAS Parallel Benchmarks," *Proceedings of Supercomputing 1991*, Nov. 1991, pg. 166-173.
19. D. H. Bailey, E. Barszcz, J. T. Barton, D. S. Browning, R. L. Carter, L. Dagum, R. A. Fatoohi, P. O. Frederickson, T. A. Lasinski, R. S. Schreiber, H. D. Simon, V. Venkatakrishnan and S. K. Weeratunga, "The NAS Parallel Benchmarks," *International Journal of Supercomputer Applications*, vol. 5, no. 3 (Fall 1991), pg. 63-73. This paper was cited for both the Sidney Fernbach Award and the H. Julian Allen Award (see above).
20. David H. Bailey, "Misleading Performance Reporting in the Supercomputing Field," *Scientific Programming*, vol. 1, no. 2 (Winter 1992), pg. 141-151.
21. David H. Bailey, "How Useful Are Today's Parallel Computers?," *Computers in Physics*, vol. 6, no. 2 (Mar./Apr. 1992), pg. 216.
22. David H. Bailey, Eric Barszcz, Leo Dagum and Horst D. Simon, "NAS Parallel Benchmark Results," *Proceedings of Supercomputing 1992*, Nov. 1992, pg. 386-393.
23. David H. Bailey, Eric Barszcz, Leo Dagum and Horst D. Simon, "NAS Parallel Benchmark Results," *IEEE Parallel and Distributed Technology*, premier issue, Feb. 1993, pg. 43-51. Several updates have been published elsewhere.
24. David H. Bailey, "Experience with Parallel Computers at NASA Ames," *International Journal of High Speed Computing*, vol. 5, no. 1 (1993), pg. 51-62.
25. David H. Bailey, Robert Krasny and Richard Pelz, "Multiple Precision, Multiple Processor Vortex Sheet Roll-Up Computation," *Proceedings of the 1993 SIAM Conference on Parallel Processing*, May 1993, SIAM, Philadelphia, pg. 52-56.
26. David H. Bailey, "Multiprecision Translation and Execution of Fortran Programs," *ACM Transactions on Mathematical Software*, vol. 19, no. 3, Sept. 1993, pg. 288-319.
27. David H. Bailey, "RISC Microprocessors and Scientific Computing," *Proceedings of Supercomputing 1993*, IEEE Computer Society, Nov. 1993, pg. 645-654.
28. David H. Bailey, Jonathan M. Borwein and Richard Girgensohn, "Experimental Evaluation of Euler Sums," *Experimental Mathematics*, vol. 3, no. 1 (1994), pg. 17-30.
29. ParkBench Committee [which included DHB], "Public International Benchmarks for Parallel Computers," *Scientific Programming*, vol. 3, no. 2 (Summer 1994), pg. 100-146.
30. David H. Bailey and Paul N. Swarztrauber, "A Fast Method for the Numerical Evaluation of Continuous Fourier Transforms," *SIAM Journal on Scientific Computing*, vol. 15, no. 5 (Sept. 1994), pg. 1105-1110.
31. Paul N. Swarztrauber and David H. Bailey, "Efficient Detection of a Continuous Wave Signal with a Linear Frequency Drift," *SIAM Journal of Scientific Computing*, vol. 16 (Sept. 1995), pg. 1233-1239.
32. David H. Bailey, "A Fortran-90 Based Multiprecision System," *ACM Transactions on Mathematical Software*, vol. 21, no. 4 (Dec. 1995), pg. 379-387.

33. David H. Bailey, "Unfavorable Strides in Cache Memory Systems," *Scientific Programming*, vol. 4 (1995), pg. 53-58.
34. David H. Bailey, Jonathan M. Borwein, Peter B. Borwein and Simon Plouffe, "The Quest for Pi," *Mathematical Intelligencer*, vol. 19, no. 1 (Jan. 1997), pg. 50-57.
35. David H. Bailey, Jonathan M. Borwein and Richard E. Crandall, "On the Khintchine Constant," *Mathematics of Computation*, vol. 66 (Jan. 1997), pg. 417-431.
36. David H. Bailey, Peter B. Borwein and Simon Plouffe, "On The Rapid Computation of Various Polylogarithmic Constants," *Mathematics of Computation*, vol. 66, no. 218 (Apr. 1997), pg. 903-913. This paper has been accessed thousands of times from various web sites, and it is mentioned on numerous web sites and in other references dealing with the computation of pi. See for example <http://www.mathsoft.com/asolve/plouffe/plouffe.html>
37. David H. Bailey, "Onward to Petaflops Computing," *ACM Communications*, vol. 40, no. 6 (Jun. 1997), pg. 90-92.
38. David H. Bailey and Simon Plouffe, "Recognizing Numerical Constants," *Canadian Mathematical Society Conference Proceedings*, vol. 20 (1997), pg. 73-87.
39. David H. Bailey, Rupak Biswas and Rob Van Der Wijngaart, "NAS Applications and Advanced Architectures," NAS Technical Report NAS-97-031, NASA Ames Research Center, Nov. 21, 1997.
40. David H. Bailey and Simon Plouffe, "Finding New Mathematical Identities via Numerical Computations," *ACM SIGNUM*, Vol. 33, No. 1 (Jan. 1998), pg. 17-22.
41. David H. Bailey, "Challenges of Future High-End Computing," in *High Performance Computer Systems and Applications*, Jonathan Schaeffer, ed., Kluwer Academic Press, Boston, 1998.
42. Helaman R. P. Ferguson, David H. Bailey and Stephen Arno, "Analysis of PSLQ, An Integer Relation Finding Algorithm," *Mathematics of Computation*, vol. 68 (Jan. 1999), pg. 351-369. The PSLQ algorithm, as defined in this paper, has been selected as one of ten "algorithms of the century" by the editors of *Computing in Science and Engineering*. See paper 46 below.
43. David H. Bailey and David J. Broadhurst, "A Seventeenth-Order Polylogarithm Ladder," submitted for publication, 1999.
44. Ji Wang, P. C. Y. Lee and David H. Bailey, "Thickness-Shear and Flexural Vibrations of Linearly Contoured Crystal Strips with Multiprecision Computation," *Computers and Structures*, vol. 70 (1999), pg. 437-445.
45. Adrian T. Wong, Leonid Oliker, William T. C. Kramer, Teresa L. Kaltz and David H. Bailey, "Evaluating System Effectiveness in High Performance Computing Systems," manuscript, Nov. 1999.
46. David H. Bailey, "Integer Relation Detection," *Computing in Science and Engineering*, Jan./Feb. 2000.
47. Adrian T. Wong, Leonid Oliker, William T. C. Kramer, Teresa L. Kaltz and David H. Bailey, "System Utilization Benchmark on the Cray T3E and IBM SP," *Fifth Workshop on Job Scheduling*, May 2000.
48. David H. Bailey and Jonathan M. Borwein, "Experimental Mathematics: Recent Developments and Future Outlook," in Bjorn Engquist and Wilfried Schmid, ed., *Mathematics Unlimited - 2001 and Beyond*, Springer-Verlag, 2001, pg. 51-66.
49. David H. Bailey and Richard E. Crandall, "On the Random Character of Fundamental Constant Expansions," *Experimental Mathematics*, vol. 10, no. 2 (June 2001), pg. 175-190.
50. Adrian T. Wong, Leonid Oliker, William T. C. Kramer, Teresa L. Kaltz and David H. Bailey, "ESP: A System Utilization Benchmark," *Proceedings of SC2000*, Nov. 2000.

51. David H. Bailey and David J. Broadhurst, "Parallel Integer Relation Detection: Techniques and Applications," *Mathematics of Computation*, vol. 70, no. 236 (2000), pg. 1719-1736.
52. Yozo Hida, Xiaoye S. Li and David H. Bailey, "Algorithms for Quad-Double Precision Arithmetic," *15th IEEE Symposium on Computer Arithmetic*, IEEE Computer Society, 2001, pg. 155-162.
53. Yozo Hida, Xiaoye S. Li and David H. Bailey, "Quad-Double Arithmetic: Algorithms, Implementation and Application," manuscript 2000.
54. X. S. Li, J. W. Demmel, D. H. Bailey, G. Henry, Y. Hida, J. Iskandar, W. Kahan, A. Kapur, M. C. Martin, T. Tung and D. J. Woo, "Design, Implementation and Testing of Mixed Precision BLAS," *ACM Transactions on Mathematical Software*, vol. 28, no. 2 (June 2002), pg. 152-205.
55. David H. Bailey, "A Compendium of BBP-Type Formulas for Mathematical Constants," manuscript, 2000.
56. David H. Bailey, "How Fast Is My Beowulf," in Thomas Sterling, ed., *Beowulf Cluster Computing in Linux and Beowulf Cluster Computing In Windows*, MIT Press, 2001 (to appear).
57. David H. Bailey and Richard E. Crandall, "Random Generators and Normal Numbers," manuscript, Mar. 2002.
58. David H. Bailey and Daniel J. Rudolph, "An Ergodic Proof that Rational Times Normal is Normal," manuscript, Oct. 2000.
59. David H. Bailey, David Broadhurst, Yozo Hida, Sherry Li, and Brandon Thompson, "High Performance Computing Meets Experimental Mathematics," *Proceedings of SC2002*.
60. David H. Bailey and Alexei M. Frolov, "Advanced Variational Approach for High-Precision Bound-State Calculations in Three-Body Systems," *Journal of Physics B: Atomic, Molecular and Optical Physics*, vol. 35 (2002), pg. 1-12.
61. David H. Bailey, "A Reclusive Kind of Science" (A review of Wolfram's *A New Kind of Science*), *Computing in Science and Engineering*, Sep.-Oct. 2002, pg. 79-81.
62. David H. Bailey, Yozo Hida, Sherry Li and Brandon Thompson, "ARPREC: An Arbitrary Precision Computation Package," manuscript, Oct. 2002.
63. C. William McCurdy, Horst D. Simon, William T. C. Kramer, Robert F. Lucas, William E. Johnston, David H. Bailey, "Future Directions in Scientific Supercomputing for Computational Physics," *Computer Physics Communications*, vol. 147 (2002), pg. 34-39.
64. David H. Bailey and Xiaoye S. Li, "A Comparison of Three High-Precision Quadrature Schemes," *Proceedings of the Real Numbers and Computing Conference*, Lyon, France, 2003.
65. David H. Bailey, Jonathan M. Borwein, Richard E. Crandall and Carl Pomerance, "On the Binary Expansions of Algebraic Numbers," *Journal of Number Theory Bordeaux*, to appear, 2004.
66. Alexei M. Frolov and David H. Bailey, "Highly accurate evaluation of the few-body auxiliary functions and four-body integrals," *Journal of Physics B: Atomic, Molecular and Optical Physics*, vol. 36 (2003), pg. 1857-1867.
67. David H. Bailey, "A Hot-Spot Proof of Normality for the Alpha Constants," manuscript, Mar. 2003.
68. David H. Bailey and Daniel J. Rudolph, "A Strong Hot Spot Theorem," manuscript, Apr. 2003.